

Poster presentation

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Raman spectroscopy and oral cancer

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Raman spectroscopy is a spectroscopic technique used in condensed matter physics and chemistry to study vibrational, rotational, and other low-frequency modes in a system. Raman spectroscopy is laser-based technique that enables chemical characterization and structure of molecules in sample. Raman spectroscopy methods are being considered as techniques which could be complementary or even alternative to biopsy, pathology and clinical assays in many medical applications.

The aim of this paper is to provide insight regarding Raman spectroscopy and its application in the medical field as a diagnostic method for the early detection and investigation of oral cancer.

Advantage of Raman spectroscopy in medical applications

1-Raman spectroscopy can be applied to a wide range of sample morphologies, including single crystals, films, fibres', suspensions, aggregates, or precipitates.

2-Samples require minimal preparation-no need for fixation or staining.

3-Can provide a high degree of information which not easy to obtain by other methods.

4-In comparison with other diagnostic techniques, Raman spectroscopy require small amount of sample.

5-Non destructive, non-invasive method for medical applications.

6-Raman spectra can be acquired quickly.

7-Raman spectroscopy is ideal for studying biological matter.

Disadvantages of Raman spectroscopy

1-A significant problem associated with Raman applications arises from inherently weak signal produced by the Raman Effect.

2-Biomedical samples are extremely intricate systems which reflect complex Raman spectra. Raman band due to biological constituents are generally overlapped, making it difficult to identify individual components correctly.

3-Due to the minimal sample preparation encountered in the clinical environment, biomedical sample samples usually produce a strong fluorescent background which may completely obscure the true Raman signals.

Raman spectroscopy is a useful diagnostic method because it is non-invasive and non-destructive. It can either be viewed as a complimentary method to biopsy or an alternative method in some instances. The technique is fast and can be used in situ. It is a technique that is comparable to fluorescence and is not only used for diagnosis of oral cancer, but potentially has many uses in the medical field.